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by-product of the government seal boneyard, was $423,000. The bones of 10,000 to 12,000 seals might have been deposited each year since to increase the store of "government-owned fertilizer," but the fur-seal law has prevented the secretary of commerce from killing them. In addition to the loss of the bone, there has been the loss in seal skins, which in the meantime have risen to a price of $50 each. Incidentally these seal skins, if they could be taken, would also be valuable cargo for the ships "that may be provided by the pending administration ship purchase bill," and less troublesome than bone to handle.

GEORGE ARCHIBALD CLARK

MATERIALS IN A TON OF KELP

THE seriousness of the current shortage of potash gives increased importance to a careful consideration of the American sources of it. The following table gives in pounds the quantities of the materials mentioned that are contained in a ton (2,000 pounds) of fresh kelp. The three species mentioned are the ones that are harvestable in commercial quantities along the Pacific coast of North America. The supply available on the California coast is mainly *Macrocystis,* that in the Puget Sound region is mainly *Nereocystis,* while that in southern Alaska is *Nereocystis, Macrocystis* and *Alaria.* In western Alaska the supply is *Nereocystis* and *Alaria.*

	Water	Potassium Chloride	Other Salts	Iodine	Algin	Crude Fiber	Nitrogen
Nereocystis luetkeana	1,834	52.7	25.1 to 37.7	0.22	23.4	8.4	2.9
Macrocystis pyrifera	1,736	52.5	26.7 to 55.7	0.61	44.4	19.3	4.3
Alaria fistulosa	1,726	39.3	27.6	Trace	No data	No data	7.1

The computations are made from data obtained by workers in the United States Bureau of Soils, the University of California and the University of Washington.

The algin here reported is the adhesive material that can be dissolved in sodium carbonate and precipitated with acids. The crude fiber reported was approximately half cellulose.

GEORGE B. RIGG
UNIVERSITY OF WASHINGTON

THE TOXICITY OF BOG WATER

THE writer has found by experiments that filtered bog waters show a precipitate when saturated with ammonium sulphate, disodium hydrogen phosphate, or sodium chloride. The filtrate from this when freed from the salt by dialysis did not prove toxic in solution cultures to the root hairs of *Tradescantia,* while the untreated bog water did prove toxic. The matter precipitated by these salts is not volatile at 100° C.

Since the specific gravity of bog water is 1.000, and its osmotic pressure is very low it seems probable that the substances present in this water are in a colloidal state. The above data tend to confirm this view and suggest that the colloidal matter may be a large factor in the toxicity of bog waters.

The waters used were obtained from sphagnum bogs in the Puget Sound region and Alaska.

GEORGE B. RIGG
UNIVERSITY OF WASHINGTON

EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY

TO THE EDITOR OF SCIENCE: The sixty-first annual exhibition of the Royal Photographic Society will be held as usual in August and September of this year. In order to facilitate the collection and forwarding of scientific exhibits I have been appointed one of the judges in the scientific section of the forthcoming exhibition and have made arrangements to receive photographs from American workers and to forward them to London, thus relieving the photographer of all difficulty and expense.

I should be very glad to hear from any American photographer who wishes to enter photographs in the scientific section of the exhibition of the Royal Photographic Society and to forward him an entry form.

For some years now the American exhibit in the scientific section has been a comprehensive one and of great interest to European workers

as showing what has been done on this side of the Atlantic, and it is earnestly desired by the council of the Royal Photographic Society that the United States should continue to be fully represented in this exhibition.

C. E. K. MEES

KODAK PARK,
ROCHESTER, N. Y.

THE CARNEGIE FOUNDATION

THE president of the Carnegie Foundation for the Advancement of Teaching has printed and distributed a long discussion of the policies of the foundation. Although this has been sent to thousands of teachers it is curiously, but characteristically, marked "Confidential." As it can not be discussed directly, the writer has reprinted the articles on the subject which appeared in SCIENCE several years ago and will be glad to send a copy to any reader of this note who may care to ask for it. It is desirable at least to watch the Greeks, both when they bear gifts and when they take them away.

J. MCKEEN CATTELL

GARRISON-ON-HUDSON, N. Y.,
April 15, 1916

SCIENTIFIC BOOKS

The Telephone and Telephone Exchange, Their Invention and Development. By J. E. KINGSBURY, M.I.E.E. Longmans Green & Co. 1915. Cloth. 558 pages, 170 illustrations. Price $4.00 net.

Considering that the telephone, in its serviceable form, is an American invention; that the telephone switchboard and exchange were first developed in America, and that the number of telephones per unit of population is much greater in America than in any other part of the world, it is remarkable that this is the first book that pretends to give a comprehensive outline of the history of telephonic development, and that this first book should have been written in England. This is an index of the general condition of inventors, engineers and engineering, all the world over. As a body, engineers are rarely gifted with talents for literature, or for historical research; yet collectively, they have transformed the surface of this planet, and have revolutionized its modes of living. However, if one should ask of a local resident near some monumental structure, grand bridge, or imposing viaduct, as to who erected it, the answer would be likely to be limited to the name of a capitalist.

This book traces very entertainingly the development of the Bell telephone, from its early conception in the mind of the inventor, to the standard instrument on so many a table of to-day. The author modestly disavows the title "history" for his book. Nevertheless, a very large amount of historical research must have been carried on by him, in order to make up the interesting narrative contained in these pages.

The following list of chapter headings will convey an idea of the scope of the historical work: Introductory, The spoken word, The growth of an idea, The undulatory current, The solution of the problem, Development and demonstration, The production of a commercial instrument, The application to commercial uses, The telephone exchange, The battery or variable-resistance transmitter, The microphone, Philipp Reis and his work, Call bells, The telephone switchboard, The organization of the industry in the United States, Competition, Consolidation and development, Introduction of the telephone in Europe and abroad, Public apathy and appreciation, The multiple switchboard, Outside or line construction, Ten years' progress, The Development of dry-core cable, Early exchange systems, Telephone engineering on a scientific basis, The branching system, The common-battery system, Automatic and semi-automatic switchboards, Long-distance service, Instruments, Rates, The economics of the telephone, The telephone and governments, Conclusion.

The task of considering the invention and development of each individual element in a modern telephone system is a very difficult one. There are so many claimants, and their claims are so antagonistic. The author has carried out this task in his own way, and with a fairmindedness that merits approbation. It